



Yorkshire Philosophical Society.

A N N U A L R E P O R T

FOR

M D C C C L X V I .



ANNUAL REPORT
OF THE COUNCIL
OF THE
YORKSHIRE
PHILOSOPHICAL SOCIETY

FOR

MDCCCLXVI.

PRESENTED TO THE ANNUAL MEETING,

FEBRUARY 5th, 1867.



YORK.

J. SOTHERAN, BOOKSELLER, CONEY STREET.

—
1867.

TRUSTEES
OF
THE YORKSHIRE MUSEUM,

APPOINTED BY ROYAL GRANT.

HON. AND VERY REV. HENRY HOWARD, D. D.
ROBERT DENISON, ESQ.
REV. WILLIAM VERNON HARCOURT, F. R. S.

PATRONESSES
OF THE
Yorkshire Philosophical Society.
HER MAJESTY THE QUEEN.
H. R. H. THE PRINCESS OF WALES.

PATRONS.
H. R. H. THE PRINCE OF WALES.
THE ARCHBISHOP OF CANTERBURY.
THE ARCHBISHOP OF YORK.

OFFICERS OF THE SOCIETY, 1867.

PRESIDENT :

HIS GRACE THE ARCHBISHOP OF YORK.

VICE-PRESIDENTS :

THE EARL OF ZETLAND, K. T.

THE LORD LONDESBOROUGH.

THE HON. & VERY REV. THE DEAN OF YORK.

WILLIAM RUDSTON READ, F. L. S.

JOHN PHILLIPS, F. R. S.

THE REV. W. V. HARcourt, F. R. S.

ROBERT DENISON.

THE REV. CANON HEY.

THOMAS ALLIS, F. L. S.

THE REV. JOHN KENRICK, M. A., F. S. A.

ROBERT DAVIES, F. S. A.

W. PROCTER, M. D., F. C. S.

TREASURER :

WILLIAM GRAY, F. R. A. S., F. G. S.

COUNCIL :

Elected 1865.. J. H. GIBSON, M. D.

REV. GEORGE ROWE.

JOHN FORD.

WILLIAM W. HARGROVE.

Elected 1866.. THE RT. HON. THE LORD MAYOR (J. MEEK).

THE VEN. ARCHDEACON JONES.

JOSHUA OLDFIELD.

W. B. RICHARDSON, M. A.

Elected 1867.. J. G. FITCH, M. A.

S. W. NORTH.

WILLIAM REED, F. G. S.

GEORGE SHANN, M. D.

HON. SECRETARY :

T. S. NOBLE, F. R. A. S.

CURATORS:

GEOLOGY AND MINERALOGY	W.M. PROCTER, M. D., F. C. S.
COMPARATIVE ANATOMY	THOMAS ALLIS, F. L. S.
BRITISH ORNITHOLOGY	W. RUDSTON READ, F. L. S.
INSECTS AND CRUSTACEA	REV. CANON HEY.
ETHNOGRAPHICAL COLLECTION	REV. THOMAS MYERS.
ANTIQUARIAN DEPARTMENT	{ REV. JOHN KENRICK, F. S. A. W. PROCTER, M. D., F. C. S.
LIBRARY	S. W. NORTH.
BOTANY	WILLIAM MATTERTON, M. D.
OBSERVATORY & METEOROLOGY, <i>under the care of a Committee consisting of</i>	{ REV. W. V. HARcourt, F.R.S. W. GRAY, F. R. A. S., F.G.S. JOHN FORD. REV. CANON HEY. T. S. NOBLE, F. R. A. S.

KEEPER OF THE MUSEUM:

WILLIAM S. DALLAS, F. L. S., C. M. Z. S.

SUBCURATOR OF THE MUSEUM & GARDENS:

HENRY BAINES.

REPORT OF THE COUNCIL
OF THE
YORKSHIRE PHILOSOPHICAL SOCIETY,
FEB. 5TH, 1867.

THE Council, in presenting their Report for the year 1866, are able to congratulate the Members on its continued prosperity.

The past year will be a memorable one in the annals of the Society as well as of the City of York. During the visit of the Prince and Princess of Wales to this City in August last, their Royal Highnesses, accompanied by the Archbishop of York (the President of the Society), were pleased to visit the Museum, and at the request of His Grace kindly allowed their names to be added to the list of our Patrons.

The Fine Art and Industrial Exhibition, by attracting a great concourse of people to York from all quarters, produced a great increase in the number of Visitors to the Museum.

In the Museum itself the Ethnographical Room (announced as nearly completed in the last Report of the Council) was opened to the public early in the Spring of last year, and the Keeper of the Museum, under the valuable direction of the Rev. T. Myers and S. W. North, Esq., has since labelled such of the specimens as could be identified. The Council can only reiterate the wish expressed in the Report of 1865, that they may be enabled, by donations of dresses, weapons, ornaments, and other articles, to render this collection more complete.

The past year has not brought to light any remarkable remains of antiquity in York or its neighbourhood. A fragment of a Roman Sepulchral Inscription, which had been fixed in the wall of All Saints Church, North Street, has been secured from further injury by being placed in the Museum. It had probably formed part of a monument, erected beside the great

Roman road from Eboracum to the south and west, which led from the shore of the river by Tanner-Row to Micklegate.

Some additions, which are specified in the list of donations, have been made to the coins and medals in the Society's possession, and the valuable British and Saxon antiquities, presented by the late Rev. E. W. Stillingfleet, have been re-arranged and more effectively displayed.

Much interest has been excited by the researches which the Rev. W. Greenwell, M. A., has carried on in the tumuli on the Yorkshire Wolds. By careful examination and comparison of their contents he has been enabled to ascertain many particulars respecting the condition of the former inhabitants of this district, who have left no written memorial of themselves nor attracted the notice of historians. Mr. Greenwell kindly communicated the results of his labours in a lecture delivered to the Members of the Society, and has promised in the same way to put them in possession of the information which he may subsequently acquire.

The MUSEUM has been recently visited by Professor Hübner, of Berlin, who has been entrusted by the Royal Academy of Prussia, in conjunction with Mommsen and other eminent scholars, with the preparation of a complete collection of Latin inscriptions. He devoted two days to the examination and transcription of those preserved in the Hospitium, and made some valuable suggestions respecting their age and import.

The GEOLOGICAL and MINERALOGICAL collections have received but few additions of sufficient importance to be specially noticed here. J. F. Walker, Esq., B. A., F. C. S., has presented a large series of fossils from the curious bed at Potton in Bedfordshire, which he has referred to the Lower Greensand in a paper read before the British Association, and since published in the Annals and Magazine of Natural History. The same gentleman has also presented a very fine mass from the Lower Greensand of Atherfield, in the Isle of Wight, containing beautiful specimens of *Gervillia anceps* and *Trigonia daedalea*. A magnificent specimen of Hæmatite from near Whitehaven, has been presented by W. J. Clutton, Esq., of the Mount, and Mr. Bollans, of Petergate, has presented a large series of Lead and Copper Ores

from North Yorkshire, the interest of which is enhanced by the details and specimens of their associated rocks which accompanied them.

The only addition to the collection of COMPARATIVE ANATOMY consisted of a series of bones of the Dodo, collected in the Mauritius by H. P. Higginson, Esq., and presented by him to the Museum. These bones, as stated in a letter from Mr. Higginson, were found in a great bog, called the Mare des Songes, in considerable quantities, by himself and Mr. Clarke. Mr. Higginson's specimens were sent home by him to be divided between the Museums of Liverpool and York, and the portion which fell to our share included fragments of the upper and lower jaws, a sternum, a pelvis, several vertebræ, and some bones of the limbs. These bones, together with casts from the Oxford specimens of the head and foot (the former presented last year by Professor Phillips), are now arranged and placed in the case near the pigeons, with which the Dodos are now almost unanimously associated by Naturalists.

The Curator of BRITISH ORNITHOLOGY has to report the presentation of a very perfect and beautiful collection of British Birds, by Mrs. Trevenen, the sister of the late Arthur Strickland, Esq., of Bridlington Quay, one of the most zealous and scientific Ornithologists of his day.

This collection was made during a long series of years, and in value and interest is not to be surpassed by any other private one. Mrs. Trevenen's attachment to her brother induced her to purchase it from his widow for a large sum, that she might present it to the Society in memory of this Naturalist. This indeed would have been done by himself, had his circumstances allowed it. The Curator ventures to mention several specimens of great value which are rare visitants and in very few Museums, viz., The Great Auk, Red-breasted Goose, Spur-winged Goose, Swallow-tailed Kite, Dalmatian Regulus, Great White Heron, Bulwer's Petrel, &c. &c. This grand addition to their other British Birds gives the Society an unrivalled collection, which will afford pleasure to the lovers of British Ornithology as also to the general public.

The ENTOMOLOGICAL Curator reports that the Cabinet of

British Insects is now in course of re-arrangement, in accordance with the most recent authorities in nomenclature and classification, and when this is completed it is hoped that this Cabinet will furnish a valuable standard of reference for persons studying this department of Natural History.

The larger LEPIDOPTERA have already been arranged by Messrs. Birks and Anderson, and specimens to help in filling up the numerous gaps in the series and to replace the many bad specimens previously existing in the Cabinet have been received from the latter gentleman and from Messrs. Allis, Brown, Dossor, Jackson, and Prest. The general arrangement of the COLEOPTERA and of the insects of other orders, will be undertaken by the Keeper of the Museum under the direction of the Curator, the Rev. Canon Hey. It is proposed, in addition to the closed Cabinets, to place a smaller collection of type specimens, exemplifying the general classification of British Insects, in the flat cases of the Gallery in the British Ornithological Room, for the inspection of Visitors generally. The remainder of these cases is occupied by the Hailstone collection of Crustacea and the British Echinodermata of the Society's collection.

The BOTANICAL Collection is in good order, but the only additions to the Herbarium during the past year have been two specimens of *Potentilla rupestris*, one of the rarest of British plants, from Breiddyn Hill, presented by W. Whitwell, Esq., of Oswestry.

The LIBRARY has been enriched by the addition of "D'Orbigny's Paléontologie Française," purchased, as indicated in the report for 1865, out of the proceeds of Mr. Kenrick's Volume of Essays.

The Curator of the METEOROLOGICAL INSTRUMENTS reports as follows:—The Temperature of York for the year 1866 was slightly above a mean of ten years, as will be seen by the annexed table. This result is owing to the high temperature of the winter months; January, February, and December, being all above a mean. On the contrary, notwithstanding the high temperature attained in July, in which month three consecutive days registered from 80 to 85 degrees, the mean of that month, as well as of May, June, August, and September, was below a mean. In

regard to rain-fall, the year was as anomalous as in temperature, the amount, 25·71 inches being 2 inches above a mean. There was an excess in June and July, a little below a mean in August, and a large excess in September. The rainfall in these months was unfavourable to the northern harvests. The mean height of the Mercurial column was low, according with the result in the Registry of Rain-fall. The least amount this year occurred in May, 0·58 inches, the greatest in September, 4·04 inches.

In consequence of the permission granted to the Curator, by a Minute of the Council, to employ Mr. Silvanus Thompson, junr., to keep the Registers in the Curator's absence, he has been enabled to supply a traced diagram of the maximum and minimum temperatures of the months from July to December inclusive. These diagrams have been posted in the vestibule of the Museum. The table number 2, supplying the Registry of the Rain-fall for Malton, Ackworth, Settle, &c., accords in its statement of increased amounts with that of York. This is particularly noticeable in the return for Settle. Mr. John Tatham states that the Rain-fall there (56·17 in.) is the largest amount he has registered in the course of years, except in 1848 when the amount was 57·49.

METEOROLOGICAL REGISTER, YORK, 1866.

	BAROMETER.			RAIN.		THERMOMETER.					
	Highest.	Lowest.	Mean.	Inches.	Days.	Average Mx.	Average Min.	Mean Temp.	Mean of 10 years, ending Dec. 31, 1865.	Highest.	Lowest.
Jan.	30·526	28·710	29·618	1·64	17	45·9	36·5	41·2	36·75	54·5	21·0
Feb.	30·324	28·796	29·512	2·50	22	45·2	34·1	39·4	37·58	57·5	26·0
Mar.	30·420	28·812	29·600	1·35	15	44·6	33·7	39·2	40·41	57·0	16·5
April	30·640	29·432	29·847	1·11	12	53·0	39·0	46·0	45·93	64·0	27·5
May	30·520	29·424	29·910	0·58	6	58·4	39·6	49·0	51·72	70·0	31·5
June	30·268	29·410	29·834	2·51	15	66·2	51·4	57·0	58·06	80·0	41·5
July	30·326	29·164	29·814	2·91	9	67·0	54·0	59·0	59·63	85·0	48·0
Aug.	30·165	29·346	29·642	3·06	16	66·0	51·0	57·0	59·73	72·0	45·0
Sept.	30·102	29·198	29·566	4·04	25	61·5	49·5	54·0	55·02	70·5	41·0
Oct.	30·548	29·566	30·003	1·87	14	56·7	46·9	51·0	48·36	68·5	34·5
Nov.	30·321	29·185	29·766	2·39	15	48·5	37·5	42·9	40·54	59·5	27·0
Dec.	30·616	28·990	29·748	1·75	18	45·8	36·8	41·3	38·64	53·0	27·0
	30·640	28·710	29·737	25·71	184	54·9	42·5	48	47·69	85	16

RAIN-FALL, 1866.

	Malton.	York.	Ackworth.	Sheffield.	Settle.
Jan.	2·31	1·64	1·76	2·78	7·92
Feb.	2·29	2·50	2·10	3·36	5·51
Mar.	2·34	1·35	1·36	2·03	2·03
April	1·35	1·11	1·17	1·41	1·02
May	0·82	0·58	0·78	0·92	0·66
June	2·87	2·51	2·71	4·18	3·85
July	3·85	2·91	3·83	4·00	5·60
Aug.	3·46	3·06	3·08	3·10	4·31
Sept.	4·78	4·04	4·69	4·87	8·25
Oct.	2·78	1·87	2·69	2·98	2·79
Nov.	2·28	2·39	3·55	3·52	7·51
Dec.	2·49	1·75	2·15	3·01	6·72
Totals	31·62	25·71	29·87	36·16	56·17

The Accounts of the Society for the year 1866 show that its finances are in a prosperous condition. Of the variable sources of income, the Swimming Bath is rather below the average, the amount produced by it being only £84 3s. 5d. The tent realised £21 15s. But the money received at the gates exceeds that of any previous year by nearly £100, being no less than £336 4s. 9d. Of course this large amount is mainly due to the great number of Visitors who came to the Exhibition during the three months it was open. The total income of the year is £1497 5s. 6d. Of the expenditure one or two items only call for remark. The amount charged for general expenses and repairs, viz., £172 13s. 10d., is considerably less than for the previous two years. The sum charged under the head of "Purchase and Preparation of Specimens," on the contrary, is larger than usual. The total expenditure of the year 1866 amounts to £1455 19s. 4d., leaving an excess of income of £41 6s. 2d. This, deducted from the balance of £272 4s. 0d., standing against the Society at 31st December, 1865, leaves a sum of £230 17s. 10d. due to the Treasurer at the end of last year.

The following NINE LECTURES were delivered in the Theatre of the Museum during the year 1866:—

FEB. 15.—On Switzerland ; by ARTHUR MILMAN, Esq., M. A.

FEB. 28.—On some of the applications of Photography ; by W. PROCTER, Esq., M. D., F. C. S.

MARCH 14.—On the general classification of Insects ; by W. S. DALLAS, Esq., F. L. S., &c.

APRIL 4.—On the Physical Geology of Yorkshire ; by Professor PHILLIPS, L. L. D., F. R. S., &c.

APRIL 11.—On the Arctic Regions ; by S. W. NORTH, Esq.

OCT. 12.—On the British Ants, by W. S. DALLAS, Esq., F. L. S., &c.

NOV. 7.—On some recent views of the Structure and Composition of Stars and Nebulae ; by W. PROCTER, Esq., M. D., F. C. S.

NOV. 21.—On Central Arabia, according to recent travels, its Physical Character and Inhabitants ; by the Rev. GEORGE ROWE, M. A.

DEC. 5.—On the Inhabitants of Yorkshire in Pre-Roman times ; by the Rev. W. GREENWELL, M. A.

Abstracts of the Papers read at the Monthly Meetings will be appended to this Report.

Thirteen new Members and five Associates have been elected during the past year, and eleven Lady Subscribers have been admitted, but the loss by death or resignation during the same period was thirteen Members, four Associates, and five Lady Subscribers. Among the Members deceased was the Rev. E. W. Stillingfleet, the presentation of whose beautiful collection of Antiquities to the Society was announced in the last Report. Of our Honorary Members, one of very old standing died towards the end of last year. This was William Bean, Esq., of Scarbro', a distinguished Geologist, whose knowledge, especially of the fossils of his own locality, although not evinced by numerous publications on his part, enabled him to furnish other writers with much valuable information, and thus gave him an influence on the progress of Yorkshire Geology which will hardly be appreciated hereafter. The Council recommend the election, as Honorary Members of the Society, of Mrs. Strickland and Mrs. Trevenen, the widow and sister of the late Arthur Strickland, Esq., as some slight acknowledgement of the magnificent present which they have made to the Society.

The Council also recommend as a foreign Honorary Member, Professor Hübner, of Berlin, and as Honorary Members, the Rev. W. Greenwell, M.A., of Durham, and Thomas Cooke, Esq., F.R.A.S., of Southampton Street, London, and of Buckingham works, in this City, a gentleman whose reputation as a scientific optician extends wherever the study of astronomy is cultivated.

The Council recommend the election of William Procter, Esq., M.D., F.C.S., as a vice-president of the Society in the place of S. W. North, Esq.; and of J. G. Fitch, Esq., Dr. Shann, S. W. North, Esq., and William Reed, Esq., as new Members of Council in the room of William Procter, Esq., Joseph Wilkinson, Esq., the Rev. Thomas Myers, and W. C. Anderson, Esq., who retire by rotation.

THE
TREASURER OF THE YORKSHIRE PHILOSOPHICAL SOCIETY
IN ACCOUNT FOR THE YEAR 1866.

Cr.	INCOME.	Expenditure.	Dr.
	£. s. d. £. s. d.	£. s. d. £. s. d.	
1866.			
<i>Annual Subscriptions, &c.:</i>			
Members	626 4 0	Crown Rents	119 0 0
Ladies	54 1 0	Corporation Rent	51 7 8
Associates	23 0 0	Rates and Taxes	9 1 8
Arrears	44 2 0	Insurance & Water Rent	14 4 3
	<hr/> <hr/> 747 7 0		<hr/> <hr/> 193 13 7
<i>Admission Fees of New Members:</i>			
Paid in full	18 0 0	<i>Salaries and Wages:</i>	
Paid by Instalments..	30 0 0	Keeper of the Museum	200 0 0
	<hr/> <hr/> 48 0 0	Subenrator	100 0 0
Keys of the Gates	48 0 0	Servant	20 0 0
<i>Temporary Subscriber</i>	1 0 0	Lodge Keeper	39 0 0
<i>Rents:</i>		Attendants (Museum, &c.)	18 2 0
New Manor Shore Prop- erty	104 14 6	Attendant(Hospitium)	9 12 0
Miss Briskham's house	49 4 0	Collector	7 12 0
Prof. Phillips' house..	15 0 0	Labourers	185 0 6
Cottages in Marygate.	32 7 10		<hr/> <hr/> 579 6 6
	<hr/> <hr/> 201 6 4	<i>Interest to Insurance Company, to</i> 31st Dec., 1866	74 14 8
Gate Money	336 4 9	<i>Interest, &c., to Bankers, to 31st</i> Dec., 1866	9 11 0
Swimming Bath (Gross)	84 3 5	<i>Museum, Gardens, &c.:</i>	
Sale of Guide to Antiquities	9 9 0	General Expenses and Repairs ..	172 13 0
Use of Tent	21 15 0	<i>Purchase and Preparation of Speci- mens</i>	81 4 4
	<hr/> <hr/>	<i>Library, for Books and Binding....</i>	45 8 5
	<hr/> <hr/>	<i>Swimming Bath:</i>	
	<hr/> <hr/>	Keeper's Salary	30 0 0
	<hr/> <hr/>	Water Rent	20 0 0
	<hr/> <hr/>	Repairs and Incidental Expenses	14 1 10
	<hr/> <hr/>		<hr/> <hr/> 64 1 10
	<hr/> <hr/>	<i>Miscellaneous Expenses:</i>	
	<hr/> <hr/>	Printing of Report and List of Members ..	19 1 0
	<hr/> <hr/>	Printing the Presi- dent's Address	14 10 0
	<hr/> <hr/>	Printing, Stationery, &c.	24 18 8
	<hr/> <hr/>	Coals and Gas	62 2 2
	<hr/> <hr/>	Expenses connected with the visit of the Prince and Princess of Wales	40 1 4
	<hr/> <hr/>	Expenses of Band....	31 1 4
	<hr/> <hr/>	Expenses of Lectures	12 9 4
	<hr/> <hr/>	Expenses of Observa- tory	2 13 6
	<hr/> <hr/>	Trees, Shrubs, Garden Seeds, &c.	23 10 0
	<hr/> <hr/>	Postages and Petty Expenses	4 18 8
	<hr/> <hr/>		<hr/> <hr/> 235 6 0
	<hr/> <hr/>		<hr/> <hr/> £1455 19 4
	<hr/> <hr/>	<i>Excess of Income, 1866.....</i>	41 6 2
	<hr/> <hr/>		<hr/> <hr/> £1497 5 6
<i>Permanent Debt:</i>			
Yorkshire Insurance Company	£1900 0 0	<i>Permanent Debt:</i>	
Due to Five Members, at £50 each	250 0 0	Yorkshire Insurance Company.....	£1900 0 0
Balance due to Treasurer 31st Dec., 1865	2150 0 0	Due to Five Members, at £50 each	250 0 0
	<hr/> <hr/> £2422 4 0		<hr/> <hr/> 2150 0 0
Excess of Income for 1866	41 6 2	Balance due to Treasurer 31st Dec., 1866	230 17 10
	<hr/> <hr/> £2380 17 10		<hr/> <hr/> £2380 17 10

Feb. 4, 1867,—Audited by us,—W. PROCTER,
S. W. NORTH.

W. GRAY, Treasurer.

MEMBERS ELECTED SINCE FEB. 1866.

1866.

- W. S. Ayrton, *The Mount.*
 Rev. F. A. Bartlett, *De Grey Street.*
 James Bennett, *Mill Crux.*
 N. H. Harrington, *Burton Lane.*
 T. Lockley, M. D., *Bootham.*
 James Lowther, M. P., *Bawtry Hall, Doncaster.*
 Rev. Charles Rose, *Precentor's Court.*
 Shepley Watson, *Bootham Terrace.*
 T. Wright, 23, *Coney Street.*
 S. P. Wilks, *Bootham Terrace.*

1867.

- Capt. E. Barnes, *The Mount.*
 E. Day, *Spurriergate.*
 Colonel Kaye, *Heworth Lodge.*

ASSOCIATES.

- Rev. J. R. Crosthwaite, *Bishopthorpe.*
 W. Hood, *Castlegate.*
 F. H. Dyke, 9, *New Street.*
 Joseph Simpson, *Petergate.*
 Thomas Smith, *East Mount Road.*

LADY SUBSCRIBERS, ADMITTED 1866.

- Mrs. Brown, 4, *St. Mary's.*
 Mrs. Clark, 37, *Bootham.*
 Mrs. Hill Dobson, *Clifton.*
 Mrs. Dundas, 22, *Blake Street.*
 Lady Fairbairn, *The Mount.*
 Miss Laybourne, *South Parade.*
 Mrs. Lukis, *Fossbridge.*
 Mrs. Mickle, 13, *Burton Lane.*
 Mrs. Nanney, *Chapter House Street.*
 Miss Nayler, 29, *Castlegate.*
 Mrs. Steele, 29, *Castlegate.*

RESOLUTIONS

PASSED AT THE ANNUAL MEETING, FEB. 5TH, 1867.

1. That the Report of the Council now read be adopted and printed for circulation amongst the Members, Lady Subscribers, and Associates of the Society.
2. That the thanks of the Society be given to the Members of the Council retiring from office, also to the Treasurer, Secretary, and Curators, for their valuable services, and that authority be given to the Council to hold Horticultural Meetings in the Museum Grounds, and to give admission to the Public to the Museum and Hospitium, on Whit-Monday and Tuesday, under the same regulations as last year.
3. That the thanks of the Meeting be given to the Chairman.

COMMUNICATIONS
TO THE
MONTHLY MEETINGS,
1866.

JAN. 2.—MR. DAVIES read a paper on the “York Cap of Maintenance.” The original Cap of Maintenance, given to the City by Richard II., being worn out in the year 1445, the Corporation purchased a new one, which cost the sum of forty-two shillings. This appears to have lasted until 1579, when it became unfit for use, and the Corporation provided a new hat, made of felt, covered with crimson velvet and ornamented with a gold edge, a gold tassel, and a gold band. The existing Cap of Maintenance answers exactly to this description, and there can be no hesitation in ascribing its date to the reign of Queen Elizabeth, or in pronouncing it to be the same hat which has been worn by the Lord Mayor’s sword-bearer upon any solemn occasion of state and ceremony for more than two hundred and eighty years.—In conclusion Mr. Davies referred to the general use of caps or hats of estate and other analogous adornments of the head as symbols of dignity, especially in the investiture of individuals with high offices. (Mr. Davies’ paper is printed in full in the *Gentleman’s Magazine* for February, 1866.)

DR. PROCTER read some “Notes on New Minerals from Finland,” in connexion with a series presented by him to the Museum. The collection from which these specimens were derived was important, from its presenting several new forms of high technical interest to mineralogists and lithologists, and also because mineral specimens reach England from Finland but rarely, and it is not probable that any fresh importations will take place from the same source. The forms of graphite in the collection are numerous and particularly

interesting. Of ferric minerals, the tantalite and columbates are almost peculiar to Finland. Tetraphyllin is another mineral, tolerably abundant in Finland, but rare elsewhere. From the numerous minerals of the Beryl family, contained in the collection, it would appear that these constitute a large proportion of Finnish minerals, and that they exist there in great variety. As the rocks of Finland are chiefly of a granitoid and schistoid character, the hornblendic and augitic groups of minerals are abundant in that country. Quartz is found of various colours, both massive and crystalline, and felspar in its two forms is abundant. Dr. Procter alluded to many other minerals, and especially to the occurrence of gypsum, meerschaum, and apatite, and finally to the erratic blocks and other traces of the great Northern Drift, so abundant in Finland.

MR. DALLAS read a few notes on the bones and shells from the Gravel of Barnwell, near Cambridge, presented by Mr. J. F. Walker. These fossils are found in a gravel pit about 14 feet deep, which shows a succession of irregular layers of coarse flinty gravel and beds of marl. The coarser gravels consist of chalk flints, intermixed with much chalk; the flints are sharp, and have, no doubt, been derived from the denudation of the upper chalk. The shells and bones are found chiefly in two beds of fine chalk marl, situated respectively about 10 and 12 feet below the surface. The shells belong to common British species, *Succinea putris* and *Bithinia tentaculata* being the most abundant. The bones include those of both living and extinct species, such as wolf, sheep or goat, ox, deer, elephant, horse, &c.

APRIL 3.—MR. THOMPSON, of Sheriff Hutton, read a paper by Lady Mary Thompson, on the “New Chinese Silkworm” (*Bombyx Cynthia*), in continuation of a paper on the same subject, communicated to the Society in 1864. Of the silkworms reared in 1864, says Lady Mary Thompson, twelve grew to the full size and spun large firm cocoons. These remained inert during the winter; they were strung on a thread, and hung up in a room of a temperature never above 52 degrees. From these twelve it was hoped to raise worms enough for carrying on the experiment in 1865. For this the following preparations were made. A breeding cage was constructed six feet square; this cage was placed in a spot sheltered from the north-east. An *Ailanthus* plant, in a pot, was placed within the cage.

Some Ailantus plants were also put into a grape house. The following is drawn from a journal, kept to note the course of the experiment.

May 22nd.—The twelve cocoons were brought in a basket, covered with muslin, into a warmer room—heat from 60 to 70—and the basket was put as often as possible in the sunshine.

June 19th.—The first moth emerged (it was a male); as the moths came out they were transferred to the cage.

July 1st.—The last emerged. The number of males and females was equal.

June 27th.—Eggs first found; they were put into a little paper tray (with the date written on it), which was hung on an Ailantus plant in the grape house, where the heat varied from 70 to 80. Afterwards, to guard against eggs being lost, owing to the plant being shaken, the boxes were kept in garden flats. From the 27th June to 10th July (both inclusive), eggs were laid daily, amounting in total to nearly 1500, and making the fair average of 250 from each female. It would appear, that temperature had great influence on the laying of the moths, the greatest number of eggs having been taken on two unusually hot days, viz., Tuesday 4th and Wednesday 5th July.

The most favourite situation for laying was on the sunny sides of the cage, but some eggs were deposited on the Ailantus.

July 8th.—Worms first found. They were two from eggs laid on the 29th, the eggs of the 27th hatched afterwards. Why should those laid on the 29th hatch soonest? The two boxes were hung on the tree close together. In the afternoon of the same day, more worms were found in the same box. Ailantus leaves gathered, were laid over the boxes, on to which the worms went immediately.

10th to 14th, the hatching proceeding,—hundreds on this latter day (the 14th),—and sprays of Ailantus, covered with the newly hatched worms, were fastened to the trees in the open air.

15th.—Very few of the youngest worms visible, but those of greater age looked perfectly thriving; a few left in the grape house seemed also doing very well. About this time we left home, and were absent till Saturday, 29th July; previous to leaving we had observed a few—a very few—of the little yellow ant (*Formica flava*).

July 29th.—Such worms as were visible on the trees in the garden had fully kept pace with those in the grape house. A few days afterwards, on making a very close investigation, only two worms could be found, and these were at once transferred, for safety, to the trees under glass. Here, the last changes were accomplished, and, though never attaining to the size or the brilliant colouring of those raised in the open air in 1864, cocoons were made. Most spun on the Ailantus plants, some

transferred themselves to the vines in pots, and twelve cocoons were all we obtained from eggs little short of 1500 in number! For so signal a failure we must try to account. There may be two causes —their natural enemies or the weather. First, the natural enemies. In a French work we find, that among the birds we have now it is only the Tomtit which takes them, and the period when it does so is, when the worm is on the point of spinning; but against this enemy, they were protected by netting. It was too early in the year for wasps, and therefore we must refer to the little yellow ant, an acknowledged enemy of these worms in their infant existence. At the time, it had escaped my recollection they were so dangerous; and, even had it been remembered, the insect is so scarce, ordinarily, at Sheriff Hutton Park, and the numbers seen were so few before we left home, that their appearance caused no apprehension. Had we stayed at home their depredations would have been noticed and checked. As the trees are protected from birds by netting, it is my firm conviction that it is to the yellow ant we are chiefly indebted for the failure of the first raising of silkworms in 1865. Nevertheless, the drought (which certainly rendered the leaves less succulent), in all probability retarded the growth of the worms, and left them for a longer time open to the attacks of their foes. We had again twelve cocoons. The moths began to emerge on the 14th Sept.; the same care was bestowed, and about 500 eggs were gathered. They also hatched satisfactorily, and the ants being gone, we hoped that this second rearing might be some indemnification for the disappointment occasioned by the first. 2nd Oct.—The trees were still in excellent foliage, and the worms seemed for a time to do very well; the weather however became very ungenial, and though never so cold as to destroy them, it reduced them to an almost torpid condition. 25th.—All that could be found were removed to the grape house. Here we tried to raise them on Ailantus foliage in water, as well as on the plants in the house, but on the latter the leaves had been nearly all devoured, and the autumn was rapidly stripping those in the garden. We sought about for a substitute for their natural food. Scorzonera, mentioned in a French work as having been used with success, was refused by the worms. Celery tops were nibbled, but decidedly were not relished. Under these untoward circumstances it is not surprising that but few of the cocoons of 1865 have been preserved. They are very small, but still, such as they are, it is not without hope that I look forward to the season of 1866. There is an old but encouraging saying, "a bad beginning makes a good ending."

MR. ALLIS made some remarks on the bones of the Dodo, which had been presented, and said that in the *Penny Cyclopædia* published in 1837 it was spoken of as a genus of birds generally supposed to be extinct, and whose very existence had been doubted. He referred to the discovery by Mr. Strickland of fragments which were ascertained to be genuine relics of the Dodo. It was only within the last few months that the predictions of Mr. Strickland as to the discovery of more bones had been fulfilled. Mr. Allis had heard that Professor Owen had received two large drawers full of them, and he thought it likely he might be able to construct a perfect skeleton of them. These bones must have been buried 200 years ; he thought the wings of the bird would be short, and that they would assist it in running if unable to fly.

MAY 1.—A “Notice of Recent Researches in the Roman Catacombs,” by the REV. JOHN KENRICK, was read. The paper was illustrated by plans, drawings, and copies of inscriptions in the Catacomb of St. Calistus, from the “*Roma Cristiana Sotterranea*” of De Rossi.

The following paper, by the REV. JOHN KENRICK, was also read. Among the objects presented by Mr. W. W. Hargrove, there are two which deserve particular notice :—A silver plate, inscribed on the one side with 16 squares, with two Hebrew letters in each square and Hebrew letters in the margin, and the sign of the planet Jupiter with the number 136 ; on the other side *Confirmo O Deus potentissimus*, with the sign of the same planet and other marks apparently astrological. A hole for suspension, as if it had been worn as an amulet, has been drilled through the top. It was obtained by the late Mr. Hargrove, in 1841, from a workman, who said he had found it, in 1829, under the foundation stone of Old Layerthorpe Bridge, destroyed in that year. It is what is called a Magic Square, in which the figures taken vertically, diagonally, or horizontally, give the same amount, in this case 34, which multiplied by 4 gives 136, the number engraved on the margin. The numbers in the squares are the Hebrew Alphabet, used according to their numerical value. The Hebrew words on the margin are made up of the letters which represent respectively the numbers 4, 34, and 136 ; but in framing these words it seems to have been the object to give them some religious significance. Thus 4 is Aba, Father ; 34 Al Aba, God—Father. From its general appearance, its Arabic figures and Italic letters, it is not conceivable that it should be of

such an age as to have been placed under the foundation stone of Old Layerthorpe Bridge, though it may have been found at the time of its demolition. It has the appearance of an application of the Hebrew character, for some magical purpose, as was common in the Middle Ages. The neighbourhood of Layerthorpe, it will be remembered, bears the name of Jewbury. The British Museum contains several such plates, supposed to belong, at the earliest, to the beginning of the 17th century. The other object, presented by Mr. Hargrove, appears to be a dollar of the Elector of Saxony, John George, Duke of Juliers, Cleves, and Berg, Grand Marshal of the Holy Roman Empire. He reigned from 1565, the date on this piece, to 1611, was the ally of Gustavus Adolphus, and fought with him against Wallenstein and Tilly. In reality it is not a coin, but a hollow box, the upper part being removable, and it is supposed to have served for the unsuspected conveyance of confidential communications.

JUNE 5.—The following paper, by the REV. JOHN KENRICK, was read. Among the objects just presented, the impression of Archbishop Waldby's seal deserves notice, as Drake has assigned it to Archbishop Holgate. The inscription reads, S. ROBTI. EBORACEN. ARCHIEPI. ANGLIE. PRIMATIS. ET DNI. DE HEXTILDESHAM, one of about a dozen ways in which Hexham has been spelt. In the list of Archbishops there are only two Roberts—Waldby, who held the see 1396-1397, and Holgate, 1545-1553. Mr. Raine has corrected Drake's error in assigning the seal to the latter. The foundation deed of Holgate's school is in the possession of the Corporation of York, but the seal is so damaged that it cannot be made out, and none remains among the documents of the Dean and Chapter.

Both the coins presented were found at Colton, near the line of the Roman road, and may have been dropped by some traveller on his way from Eburacum to Cambodunum. The second Iter of Antoninus, starting from Middleby in Dumfriesshire, comes down through Carlisle, Brough, Catterick, and Aldborough to York, and then proceeds by Calcaria and Cambodunum to Mancunium, and so to Deva, Chester. That Calcaria is Tadcaster is not disputed, nor that Mancunium is Manchester; but various have been the opinions of antiquaries as to Cambodunum. Camden, who visited the West Riding in 1599, saw in the house of one of the Savile family at Bradley, near Cooper's Bridge, an altar with an

inscription to a local deity of the Brigantes, which, he was informed, had been found at Gretland, where a small stream called the Black Brook joins the Calder. Camden did not himself, however, connect this altar with Cambodunum, but placed that station at Almondbury, about two miles south of Huddersfield, where there are some very remarkable remains, but nothing Roman. Horsley dismissed this idea, but fixed on Gretland; and though he could find no traces of a Roman station there, he thought his opinion confirmed by the circumstance that Roman coins and tiles had been discovered at Elland and Grimscar, both in the neighbourhood of Gretland. It was to the Rev. Mr. Watson, author of a history of Halifax, that Slack is indebted for the honour of being identified with Cambodunum. He was a field antiquary, exploring on foot every part of that extensive parish, and particularly directing his attention to the traces of Roman occupation. He found in a farmer's yard in Stainland, not far from Elland, an altar with a Roman inscription, and on inquiry, was informed that Slack, which lies a little to the west of Stainland, and near Ripponden, was the place from which it had been brought. It was a votive offering to Fortune, by Antonius Modestus, of the Sixth Legion, so long quartered in York. Subsequently various other Roman remains were found at Slack, and Mr. Whitaker, the historian of Manchester, as well as the Rev. Dr. Whitaker, declared in its favour as the site of Cambodunum. The subject naturally came under Mr. Wellbeloved's consideration when treating of the Roman roads and stations in Yorkshire, and in his *Eburacum* (p. 157) he mentions Horsley's decision in favour of Gretland, and Watson's doubt respecting the discovery of the altar at Gretland. This produced a communication to him from the late Rev. J. Hunter, in which he says, "There is not the slightest ground for Mr. Watson's doubts respecting the discovery of the altar at Gretland. I have found a most exact and punctual notation of the discovery, in April, 1597, by a Halifax antiquary of that period, who fixes precisely the place, as well as the person by whom the altar was discovered. Camden was in that neighbourhood in August, 1599, when he became acquainted with the discovery, and introduced a notice of it in the next edition of the *Britannia*, published in 1600. This gives Gretland at least an equal chance with Slack to be Cambodunum, and so I suspect it will at last turn out—to the honour of Horsley more than of Watson, or either of the Whitakers. I mean to print the circumstance forthwith."

Accordingly, Mr. Hunter communicated a paper to the Society of Antiquaries, which appears in vol. 32 of the "Archæologia." In this paper he gives from the Dodsworth MSS. in the Bodleian, a contemporary memorandum by Mr. John Hanson, of Elland, of the discovery of the altar, with a drawing and copy of the inscription, corresponding exactly with Camden. This piece of evidence, brought to light by the various learning of Mr. Hunter, completely establishes the fact of the discovery of the altar at Gretland, but cannot decide the question as to the site of Cambodunum. Allowing the Gretland altar and the Slack altar to pair off together, we have to compare the remaining evidence; and this, even before the late researches at Slack, was strongly in favour of that place. They have brought to light foundations of buildings, hypocausts, fragments of Samian and other pottery; and the extent of ground which these remains occupy, and which appears to be only a part of the original station, is a proof of its importance, and of its being more than a temporary residence of the Romans. The most recent of these discoveries is particularly interesting to us—a ridge tile tomb, exactly corresponding with those in our museum. The rarity of this mode of interment may warrant the inference that the troops stationed at Slack were a detachment of those whose head-quarters were at Eburacum. Of the tombs in the Hospitium one has the impress of the Ninth Legion, the other of the Sixth; but as the latter remained so much longer in York, I am inclined to refer the newly-discovered tomb to them. Instead of a legionary stamp, however, it is marked coh. III BRE. The opinion entertained by Camden and Horsley, that BRE was an abbreviation of Bretonum or Bretannorum, is not supported by any example in which, in Latin, E in this word is substituted for I. It would have been contrary to Roman policy to employ British troops in Britain. The Emperor of Austria does not garrison the Quadrilateral with Venetians. It was one of the grievances of which Galgacus complains, (Tacitus Agr. c. 31,) that the young men were taken "alibi servituri." There would not be the same objection to the supposition that BRE stood for Brittonum; for I believe Brittones was not equivalent, as has been commonly supposed, to Brittanni. The Brittones were probably a Gallic tribe,* and served, as appears by inscriptions in Horsley, in England and Scotland. But in these there

* Martial (xi. 22) attributes to them the braccæ, a Gallic garment. (Propert. iv. 10, 42). Britones and Brittanni are mentioned in the same inscription. See Orelli Inscr. 804.

is no example of the use of E for I. I am therefore inclined to the opinion of Mr. Roach Smith, that BRE is an abbreviation of Breucorum. The Breuci were a warlike tribe of Pannonia, who had been subdued by Tiberius and Germanicus in the reign of Augustus, and who furnished a large body of auxiliaries to the Roman armies. No other auxiliaries, mentioned in inscriptions, had a name of which B R E are the three first letters. The Sixth Legion came from Germany in the reign of Hadrian, and might naturally bring with it German auxiliaries. It deserves notice that, in inscriptions in various parts of the Roman empire, cohorts of the Breuci, numbered I II III, and V VI VII VIII occur, but none of IIII. It is true that, if the books of inscriptions are to be trusted, the name is elsewhere always written at full length, but I do not think this decisive; and till a better claimant appears, I am disposed to assign to the Breuci the honour of having garrisoned Cambodunum. The smaller stations appear, from inscriptions, to have been occupied by the cohorts of auxiliaries, as Bowes by the Thracians, and Ilkley by the Lingones, and not by the legionaries (whose memorials are chiefly found in the larger ones), though a legionary officer would be in command. There still remains a great difficulty respecting the distances given in the Iter; Cambodunum is made xx miles from Calcaria and xviii from Mancunium. Both these distances are too small, and as they no more agree with Gretland than with Slack, they cannot help us to decide between them.

OCT. 2.—The REV. JOHN KENRICK read the following paper “On the British Coins in the Society’s Cabinet.” It was illustrated by a series of diagrams, by John Evans, Esq., F.S.A., showing the origin of the Gallic and British coinage from the stater of Philip II. of Macedonia.

It is a remarkable circumstance in the history of civilization that coined money, metal bearing a stamp by which value and public character are ascertained, should have been so late an invention. The Egyptians, Chaldeans, and Assyrians had attained great skill in metallurgy; they had written characters; they had extensive commerce; but in the time of their independence they never had a coinage. Even the Phœnicians had it not till a late period—certainly not till after their subjugation by Persia. The Lydian and Persian gold pieces, imperfectly answer to the definition of a coin, as they have only the device of a lion or an archer, but no inscription. The Argives or Æginetans were the first whose

money bore a stamp and an inscription, attesting the authority of its issue.

The Greeks in Europe for a long time coined only silver, which abounds in the south of Greece. But the kings of Macedonia, having got possession of the rich gold mines of Thrace, and commanding at the same time the services of the first Athenian artists, put forth a gold coinage which is among the best specimens of ancient art. The stater of Philip II., of Macedonia, became, through the intermediation of Gaul, the type of the coinage of the independent Britons, which forms the subject of this paper.

Two principal discoveries of British coins have been recorded in Yorkshire, and both nearly in the same locality. The first was made in 1827 at Lightcliffe, near Halifax. Four British coins were found here in conjunction with others of the Roman Consular and Imperial series, the latest being of Caligula and Agrippina. They appear to have passed into the museum of a Derbyshire collector (Mr. Bateman), like many other Yorkshire antiquities. The second find was at Almondbury, one of the places which has been assigned as the Cambodunum of the Itinerary. The discovery is thus noticed in our Society's Report for 1829:—"A considerable number of Roman denarii having been lately found in the vicinity of Huddersfield, sixteen of the most perfect were purchased for the Society, and with them eight very rare and interesting British coins, found at the same place, belonging to the class called the coins of Cunobelin." The Lightcliffe find cannot have been deposited before about A.D. 40, and probably not much later. The Almondbury find, containing only Consular coins, is probably earlier, as their issue ceased in the reign of Augustus. Their description, as coins of Cunobelin, is indicative of the imperfect classification which then prevailed. The pieces bearing his name were first noticed, and as they were engraved in Camden and the works of Pegge and Stukeley, "coins of Cunobelin" came to be loosely used to describe the whole class of British coins. At present it is possible to arrange them in a more precise manner. In the work of Mr. Evans, which exhibits the latest results in this branch of numismatics, and a series of exact engravings, a local arrangement is adopted, partly founded on the legend of the coin, partly on the place of discovery, and the frequency of occurrence in a particular district. Where the name is one well known to history, as that of Cunobelin, there can be no hesitation in ascribing it to the kingdom of which first Camulodunum and then Verulamium was the capital,

what we now call the home counties. And the fact that his coins are found in greatest numbers in that district warrants the conclusion that names unknown to history represent rulers of those regions in which the coins so inscribed abound. Uninscribed coins may, from a resemblance in type and fabric, be safely referred to the same ruler, or at least the same kingdom, as the inscribed. Following out these principles, Mr. Evans arranges the British coins in six classes: the Western district, the South Eastern, the Kentish, the Central, the Eastern, and the Yorkshire or Brigantian. The largest numbers have been found in Kent, according with the fact which Caesar notices, and which subsequent history confirms, that this was the most civilized province of Britain; the Brigantian district is the poorest. Besides the Lightcliffe and Almondbury hoards, only one discovery has been made in Yorkshire—at Pickering. In Lancashire, and the counties north of York, none at all. This, too, accords with history. The Brigantes were a powerful and warlike race, but except in the immediate neighbourhood of the Roman stations their civilization was late and imperfect. All the British coins are coarse copies of the stater of Philippus, through the medium of copies by the Gauls; but the Brigantian are the rudest of all, and without the continuity of degradation which is manifest in comparing a series of specimens, it would have been impossible to have established their original derivation from Macedonia. There are now only five of these coins in our cabinet, the other three were probably duplicates, and have been parted with in exchange. No. 1 in the catalogue has on the concave side a rude figure of a horse and the letters VEP. and CORF. Their meaning is unknown; but from analogy we may conclude they are part of the name or title of the ruler of the country. The British, like the Gallic, coins are very much *dished*, as it is called—concave and convex. The letters are evidently Roman, the ligature of v and ce being copied. No. 2 is a duplicate of No. 1, the legend CORF being less perfect. No. 3 on the concave side has DVMNOCO VER OS and a horse; on the convex side in two lines VO SI, which, from a more perfect example, No. 4, appears to have been the beginning of VOLISIOS. No. 5, which I believe is unique, has the usual type on the convex side; on the concave IIISVP, and below the horse CV or SV. The metal of these so-called gold coins is exceedingly base; their weight varies from 3 dwt. 3½ gr. to 3 dwt. 14 gr. There is also a silver coin, weighing 20 gr., having the figure of a horse on one side and a head rudely formed on the other. Also one of base

metal, corresponding with that Pl. xvi., 8, Evans. I have no memorandum of the place where it was found, but it resembles those from Suffolk, the country of the Iceni. Another, still more impure, is of the type which Mr. Evans refers to the Channel Islands. Another, found by Mr. Rudston Read, has been noted by Mr. Wellbeloved with a (?) as British copper, but I do not find in Mr. Evans's work anything corresponding to it.

No satisfactory explanation has been given of the legends on the gold coins; but as Dumnorix and Dumnacus are names of Gallic chieftains, it is not improbable that Dumnocoverus may have been a chief of the Brigantes. The latest time at which we can suppose them to have had an autonomous coinage is the expedition of Agricola, who came to Britain A.D. 78, and who made it the special object of his administration to efface the independence of the Britons, and thoroughly amalgamate them with their conquerors.

It may be asked, What has been the gain to history from the researches into the British coinage? It is something to have saved antiquaries from wandering in the labyrinth of conjectures, in which they have formerly lost themselves. No one will in future take the neck and leg of the horse, in one of the degenerate types, for the golden knife with which the Druids cut the mistletoe, or suppose that the British coins contain symbols of helioarkite mysteries. The names and succession of some of the British princes, the place of their dominion, the commencement and termination of their coinage, have been fixed with probability. And as it has been ascertained that Cæsar was wrong in supposing (*Bell. Gall.*, v. 12) that the Britons had no coined money, we may be allowed to doubt, whether he was not also in error in other statements, more deeply affecting the character of our predecessors.

MR. J. F. WALKER, F.C.S., next read a paper "On a phosphatic deposit lately discovered in the Lower Greensand of Bedfordshire." The discovery of a new deposit of phosphatic nodules was made about three years since in the Lower Greensand of Bedfordshire, in the vicinity of Potton. This bed was formerly quarried for mending the roads, until it was found to contain the nodules for which it is now extensively worked. A section at a cutting near Potton Railway Station, shows, commencing at the bottom:— 1, sand of different colours (in some places white); 2, conglomerate bed (9 in. to 1 ft. thick); 3, sand of different colours, containing

oxide of iron, about 12 ft. At a coprolite working on the left side of the line, looking towards Cambridge, a few yards from the edge of the cutting, the bed increases in thickness to two feet. At a large working on the hill the conglomerate bed is about six feet thick, the section being as follows:—1, sandstone, on which conglomerate rests; 2, conglomerate (6 ft.); 3, flaggy sandstone, not exceeding 1 ft. in thickness (often less), and surface soil. The lower part of the conglomerate here is darker in colour and more indurated than the upper. On the other side of the road there is another working where the nodules lie in a loose sand, and the phosphate bed is about one foot thick. There are several other workings in the neighbourhood. The conglomerate contains phosphatic nodules and pebbles in about equal proportions. The bed is dug out, sifted, washed, and laid in heaps, then conveyed into sheds, where the nodules are picked over by hand. The quantity of phosphoric acid in the nodules varies from 15 to 22 per cent. The deposit consists of ferruginous sand, more or less indurated, rolled pebbles, light brown nodules of phosphatic matter (which have an earthy fracture and often contain remains of shells), and lumps of hardened clay. The nodules contain a much larger percentage of alumina than those of the Cambridge Greensand. This would indicate that the phosphatic nodules had been formed of clay soaked in decomposing animal and vegetable matter, since the alumina could not be derived from animal or vegetable sources. The nodules are often covered with perforations, which Mr. A. Wanklyn discovered to be the work of small bivalves, of which he obtained several species. The remains of organic life found in this deposit exist in different states of mineralization, and some are coeval with the bed, whilst others have been washed out of pre-existing deposits. Of vegetable remains there are large masses of silicified wood, apparently from the Purbeck; smaller fragments of phosphatized wood, often bored by a new species of *Pholas* (*P. Dallasii* Walk.); and a cycadaceous cone evidently from the Wealden.* The animal remains include numerous rolled and water-worn bones and teeth of Reptiles and Fishes, and traces of Mollusca in two distinct conditions. Some of the latter consist of phosphatic casts, which are so much worn that it is impossible to identify them; they are probably derived from the Kimmeridge and Oxford Clays. *Ammonites biplex* occurs abundantly, and one or two other species are found. Phragmocones of *Belemnites* like-

* Described by Mr. Carruthers as *Cycadeostrobus Walkeri*.

wise occur. The other shells are ferruginous and include, of introduced species, *Gryphaea dilatata* and *Exogyra virgula*; whilst *Terebratula tamarinduss* and *celtica*, *Pleurotomaria Delahaysii*, *Peeten Robinaldinus*, *Ostrea macroptera*, and a new species of *Sphæra* (*S. Sedgwickii* Walk.), seem to belong to the bed and to indicate its age as being the period of the Lower Greensand. The bones and teeth of fishes, all derived from older formations, represent the following genera:—*Sphærodus*, *Pycnodus*, *Gyrodus*, *Asteracanthus*, *Leptacanthus*, *Hybodus*, *Sphenonchus*, *Lepidotus*, *Psammodus*, and *Edaphodon*. The Reptilian remains include bones and teeth of *Plesiosaurus*, *Ichthyosaurus*, and *Pliosaurus*; some teeth belonging apparently to a species of *Dakosaurus*; and an abundance of water-worn remains of *Ignanodon*, associated with fragments of rock, containing *Cyrenæ*, indicating that the denudation of Wealden beds has co-operated with that of beds belonging to the Oxford and Kimmeridge clays, in furnishing the materials for this curious deposit.

Nov. 6.—The Rev. J. KENRICK read the following paper “On Roman silver coins of the Consular series,” presented by him.—It is called Consular, because it began when Rome was governed by Consuls, and ceased when the imperial government was established. The unit of the Roman monetary system was a pound weight of brass, or rather of bronze, for the *as* contains a proportion of tin, about seven per cent., with a large mixture of lead. Zinc is not found till the imperial times. The name *as* in itself, however, does not denote any specific weight. It is a dialectic form for *Eis* (Gr. *one*), and is used for unity in other connexions, as *haeres ex asse*, sole heir. The French *as* and our *ace*, on dice and cards, are the same word. Originally the *As* was a pound of twelve ounces, but, like our own monetary pound, it underwent various reductions, especially in the Punic wars, and at the time when the series of silver denarii begins it had been reduced to one ounce. The name *denarius (tenner)* shows that it was reckoned at ten asses, and so it is said to have been valued in the soldier’s pay, but it was really worth sixteen in the reduced scale. I should observe that there is much obscurity and inconsistency in the statements of the Latin writers respecting the history of their coinage. It is agreed, however, that the first silver coinage took place just before the first Punic war; Pliny says 485 u. c. or b. c. 269. The Romans had made already considerable progress in that course of conquest, which placed all

southern Italy in their hands. They had driven out Pyrrhus, who had come to the aid of the Tarentines, and had taken their city; they had reduced the Samnites, Bruttians, and Locrians, and from these regions, much richer than Latium, they had derived an increase of wealth, of which the introduction of a silver coinage was the natural result. Nothing was indigenous in art at Rome, and there are only two sources to which we can look for its origin, Etruria and Greece. Now Etruria seems to be excluded in this case, by the circumstance, that only one Etruscan state, that of Populonia on the sea coast, opposite to Elba, is known to have coined silver, and its type is very different from that of Roman denarii, one side being plain. On the other hand the Greek colonists of Magna Græcia and Sicily had long been in possession of a silver coinage, and the Roman denarius and the Attic drachma were so nearly of equal value that the Greek historians of Rome use them as synonymous. *As* is the form of *eis* in the Tarentine and Sicilian dialect of Greek. The pure Greek word for coin is *Nomisma*, but the Tarentines called it *Noummos*, whence the Latin *Numus*. The female helmeted head, which appears on the earliest denarii, also resembles that on the coins of some of the towns of Southern Italy.

It is impossible to say what is the age of the earliest silver denarius now to be found in cabinets; but a progress in their execution and type can be clearly traced. The oldest have on the one side a female head with a helmet, the crest of which is jagged; on the other side the two Dioscuri on horseback, their lances in rest, their mantles streaming in the wind, a sailor's cap on their heads, and above them the stars, the emblems of the "Frates Helenæ lucida sidera." Next in antiquity to these appear to be the denarii with a similar head on the obverse, and on the reverse Victory in a *biga*. The mythical appearance of Castor and Pollux, fighting for the Romans at the Lake Regillus, might account for their selection, but at Rome they seem to have had some special connection with money. Their temple in the Forum was the Roman Bourse, the resort of the money lenders. The only inscription on these earliest denarii is ROMA, and hence the head has been supposed to be a personification of the city; but it is generally found on the reverse, and not accompanying the head, and therefore probably indicates Rome as issuer of the coin. The denarii with a biga and quadriga, from their superior purity and weight, were valued more than those of later coinage. Tacitus (Germ. 5)

notices the preference of the Germans also for the *nummi serrati*, those with the indented edges (improperly called by us "milled"), as being older than those with smooth edges, but this is not the fact; they are very rare till about a century b. c. It was no doubt the security against clipping which made the Germans prefer them. The silver of the republican denarii is very pure. Some choice specimens reach the weight of sixty grains, but generally they do not exceed fifty-two.

In process of time both the obverse and the reverse varied greatly from the primitive simple types. Originally no name of mint-masters appeared on the silver coin, the people in the *comitia tributa* ordaining its issue; but about the time when the Roman Government from republican became oligarchal, that is after the Punic wars, we find this function committed to officers whose title ran "*Tresviri monetales auro argento ære flando feriundo.*" As no gold had been coined at Rome at this time, it should seem to have been part of their duty to stamp bars of gold with some mark of their purity. The mintmasters soon began to place their own names, including that of their *gens*, upon the coins issued by their authority. Other heads took the place of the helmeted head on the obverse, and the reverse was occupied by devices allusive to legendary or historical events connected with the family of the mintmaster; but no one presumed, in Republican times, to place his own head on a public coin. The name of the consul of the year never appears on a denarius, that of the *prætor* very rarely. The issue of silver money seems to have been decreed by the assembly, that of brass by the senate. S. C. (*senatus consulto*) appears normally on the *as* and its parts; very rarely on the silver, and then it is probable from some special reason, leading the senate to intervene. The consular series came naturally to a close with the overthrow of the republic and the substitution of the imperial head and titles. The last of this series belongs to 38 b. c. (u. c. 716). The purity of the silver and the weight of the coin remained unimpaired till the time of Nero, when it began to be alloyed. In the reign of Severus the silver coin had become completely debased, and so it continued till Diocletian brought it back to the standard of Nero's reign.

A remarkable discovery of coins of the Consular series has lately taken place in France, which well illustrates its relation to history. One of Cæsar's great battles with the Gauls was fought at Alesia, as related in the 7th book of his Commentaries. There had long been a dispute among the French antiquaries and geographers

whether Alise-la-Reine in Burgundy or Alaise in Franche Comté represented the Alesia of Cæsar. The discovery of vast numbers of weapons, apparently Roman, at Alise-la-Reine, in consequence of the researches set on foot by the Emperor, did not silence the advocates of Alaise ; they said the weapons were Frankish. But the controversy has been settled by the discovery at Alise-la-Reine of a hoard of consular denarii and quinarii. The oldest of them to which a date can be assigned is of 174-166 b. c., the latest of 54 b. c., the battle and siege of Alesia having taken place in 52 b. c., as we know from the chronology of the times. Supposing that we did not know this date, we should be certain that the battle of which the weapons and the coins testified could not have taken place earlier than 54 ; and the finding of no coin later than 54 would be a presumption that no long period had intervened between that year and the year of the battle. As the inference is exactly confirmed in this case by the voice of history, we may use the evidence of coins to supply its silence. Our antiquaries and historians are still at variance about the place where Cæsar landed in Britain. Mr. Lewin contends that it was Hythe; Dr. Cardwell, Deal; General Roy fixed on Richborough; Professor Airy calls the Channel tides to witness that it must have been Pevensey, but his opponents do not yield even to the evidence of the Admiralty surveyor. There is one criterion which I should regard as decisive, but I am afraid we are not likely to obtain it. Cæsar's first expedition to Britain took place 55 b. c. Now if in any of the rival places a hoard of consular denarii should be discovered, ending the year before, or at all events not passing, the year 55, all the others must withdraw their claim. Till then I fear it must continue a *vexata quæstio*.

A remarkable instance from our own immediate neighbourhood shows how discoveries of coins may confirm an historical date. In the published volume of our society's papers, pp. 66, 197, will be found accounts by Mr. Wellbeloved and Mr. Davies, of a hoard of stycas, found at Bolton Percy in 1846. Of the Northumbrian kings whose names they bear the last is Osbercht, and with him the series of stycas ceases altogether. Now the kingdom of Northumbria, and of course its coinage, came to an end in 867, by the death of Osbercht, and the capture of York by the Danes. And it is almost certain that the treasure was concealed when this invasion took place. I will mention one other instance of a remarkable confirmation of history, derived from a discovery of coins. Herodotus

tells us that Xerxes dug a canal across the isthmus of Mount Athos for the passage of his fleet. We know how the Roman satirist ridiculed this as a fable. “Creditur olim Velificatus Athos et quidquid Græcia mendax Audet in historia.” The discovery, some years since, of a large number of Persian Darics and Attic tetradrachms, in the line which still indicates an ancient excavation, must surely establish the authority of the old historian.*

DEC. 4.—DR. PROCTER read a paper on “Meteorites.” He commenced by indicating the identity of the various bodies known as shooting or falling stars and aerolites, and described the characteristics and chemical constitution of the different kinds of the latter, and the general phenomena attending their fall. He then remarked upon the theories which have been proposed to account for these remarkable facts, such as the old notion that they were solidified in the atmosphere,—that put forward by several distinguished physicists, that they are projected from volcanoes in the moon, an opinion negatived by the fact that our satellite appears to possess no active volcanoes, and still more strongly by the calculations of Olbers and others which show that the velocity of aerolites is nearly three times as great as would be attained by bodies projected from the moon with sufficient initial velocity to reach our planet,—and those which attribute the production of meteorites either to terrestrial volcanoes or to the sun, neither of which is tenable. The generally received hypothesis is that which regards meteorites generally as cosmical bodies revolving round the sun in one or more orbits, intersected at certain points by the orbit of the earth; by this hypothesis the remarkable periodicity of the appearance of meteors is accounted for, as also the fact of their starting from particular points in the heavens. In passing through the earth’s atmosphere these bodies become incandescent, giving rise to the luminous phenomenon, known as shooting or falling stars:—when they descend within a certain distance of the body of our planet they fall to its surface, generally undergoing an explosion, and constituting aerolites. The evidence in favour of there being several belts of meteorites revolving round the sun, in orbits nearly approaching that of the earth in their radii, is to be found in the occurrence of considerable numbers of shooting stars at particular periods in the year, the chief of these

* Mommsen *Römisches Münzwesen*, p. 9.

being about the 13th November, and the 10th August. Smaller manifestations of the same phenomenon are believed to recur between the 22nd and 25th April, the 6th and 12th December, and about the 17th July. With regard to the origin of meteorites, the hypothesis has been put forward that they are derived from the vapours given off during the ebullition of the sun's atmosphere, which it is supposed become condensed into a sort of lenticular disc perpendicular to the sun's axis of rotation, and giving rise to the phenomenon known as the Zodiacal light. By further condensation in the interplanetary space, the metallic and other elements thus thrown off from the sun, are believed gradually to form the nuclei of meteorites, and the chemical constitution and internal structure of those which every now and then reach the surface of the earth would seem, according to Mr. Sorby, to support this view of their origin.

DONATIONS TO THE MUSEUM.

GEOLOGY AND MINERALOGY.

- Bollans, Mr. R. (*York*) . . . Specimens of Lead and Copper Ores,
from North Yorkshire, with the
accompanying Rocks.
- Clutton, W. J., Esq. (*York*) Fine specimen of Hæmatite, from near
Whitehaven.
- Duff, Mr. Joseph (*Etherley*) Fossil Starfishes, from the Millstone
Grit of Stanhope Common.
- Noble, T. S., Esq. Specimen of Jet, from the Lias of
Kilburn, near Thirsk.
- Shillito, Mr. J. (*Northowram*) Fossils, from the Coal Measures of
Halifax and Low Moor.
- Walker, J. F., Esq. A Collection of Fossil Bones, from the
Gravel, near Cambridge.
Fossils, from the Lower Greensand of
Potton, Bedfordshire.
Fossils, from the Cornbrash of Rush-
den.
Masses of Fossils, from the Lower
Greensand of Atherfield, Isle of
Wight.
Fossil Plant, from the Stonesfield
Slate.
-

ZOOLOGY.

- Anderson, Mr. R. Numerous specimens of British Le-
pidoptera.
- Baines, Mr. H. Exotic Shells.
- Brown, H., Esq. (*Bradford*) British Moths.
- Dossor, Mr. J. H. Numerous specimens of British Le-
pidoptera.

- Higginson, H. P., Esq. }
(Mauritius) } A collection of Bones of the Dodo.
- Maclarens, —, Esq. (*Con-*
stable Burton) } An Albino Blackbird.
- Morris, Rev. F. O. (*Nun-*
burnholme) } Indian Coleoptera and Lepidoptera.
- Phillips, Professor Cast of the Head of the Dodo.
- Roper, John, Esq. (*York*) A specimen of the Three-Bearded
 Rockling (*Motella vulgaris*), from
 Redcar.
- Thomas, Mr. Edwin (*Car-*
shalton) } Specimens of *Pennatula phosphorea*.
 } Specimen of *Aphrodite aculeata*.
- Trevenen, Mrs..... Mr. STRICKLAND's collection of British
 Birds.
-

BOTANY.

- Whitwell, W., Esq. (*Oswes-*
try) } Specimens of *Potentilla rupestris*.
- Baines, Mr. H. Fruit of Nutmeg.
-

ANTIQUITIES.

- Clothier, J. W., Esq. (*Street*) A Denarius of Julian the Apostate.
- Ellis, Mr. W. (*Herald Office*) An old Deed, dated 1629.
- Guest, Rev. G. An inscribed Stone and fragment of
 Samian Ware, from All Saints'
 Church, North Street.
- Hargrove, W. W., Esq. }
(York) } Coins.
- Kenrick, Rev. J. Sixteen denarii of the Roman Con-
 sular series.
- Key, Mr. Thomas (*Fulford*) A Sword Hilt, found at Thorn Moor,
 near Doncaster.
- Noble, T. S., Esq. (*York*) An impression of the Seal of Arch-
 bishop Waldby.
- Walker, J. F., Esq..... Fragments of Vases from Cambridge.
 Purchased Two Roman Silver Coins.

MISCELLANEOUS.

- Barber, Chas., Esq. (*Os-
baldwick*) } Brick from the surface of the Porce-
lain town of Nankin.
- Gibson, J. H., Esq., M. D. Specimens of Cloth and Paper, from
the bark of the Paper Mulberry;
brought from Tahiti by Vancouver.
- Glaisby, Mr. W. Photographs of the two specimens of
the Great Auk, now in the Society's
possession.
- Palmer, Rev. H. V..... Fragment of Ivory containing a
Bullet.
-

GARDENS.

- Oldfield, Messrs. Four Loads of Manure.
- Low, Messrs. (*Clapton*) .. Various Plants.
- Kew Royal Botanic Garden Various Plants.
- Liverpool Botanic Garden Various Plants.
- Wake, Capt. B. A., R. N. Roots of *Peristeria elata* (*El Espiritu
Santo*), from Darien.
-

LIBRARY.

- Admiralty, The Lords Com- } Greenwich Observations for 1864.
missioners of the }
- Association, British, for the } Report for 1865.
Advancement of Science }
- The Author The York Cap of Maintenance; by
R. Davies, Esq.
- The Author Rien ne naît, rien ne meurt; by M.
Boucher de Perthes.
- The Author The celebrated Theory of Parallels;
by Matthew Ryan, Esq., of Wash-
ington.
- The Author The Boat and the Dial; by the Rev.
W. Hewson.

- The Author On a Phosphatic Deposit in the Lower Greensand of Bedfordshire ; by J. F. Walker, Esq.
- The Author Notices of the Ellises (Nos. 1, 2, & 4) ; by W. Smith Ellis, Esq., *Hurstpierpoint*.
- Dallas, W. S., Esq. (*York*) Hurstpierpoint, its Lords and Families ; by W. Smith Ellis, Esq.
- Christiania, University of A Catalogue of Phytophaga, (part 1) ; by the Rev. Hamlet Clark.
- Address of the President of the Linnean Society, May, 1866.
- Symbolæ ad Historiam antiquorem Rerum Norvegicarum: Edidit P. A. Munch.
- Om *Siphonodentalium vitreum* en ny Slægt og Art af Dentalidernes Familie (on *Siphonodentalium vitreum*, a new genus and species of the family Dentalidæ) ; by Dr. Michael Sars.
- Beskrivelse over *Lophogaster typicus*, en Mærkværdig Form af de lavere tiffödede Krebsdyr (Description of *Lophogaster typicus*, a remarkable form of the lower Decapod crustacea) ; by Dr. Michael Sars.
- Physikalske Meddelelser ved Adam Arndtsen . . . udgivne af Dr. Christopher Hansteen (Physical Essays by Adam Arndtsen ; edited by Dr. C. Hansteen).
- Norske Vægtloder fra fjortende Aarhundrede, beskrevne af C. A. Holmboe. (Norwegian Weights of the fourteenth century, described by C. A. Holmboe).
- Om Kometbanernes indbyrdes Beliggenhed. (On the relative positions of the paths of Comets) ; by H. Mohn.

- Christiana, University of.. Om Cirklers Beröring. (On the contact
of Circles); by C. M. Guldberg.
- Houghton, Lord Plants indigenous to the Colony of
Victoria, vol. i.; by F. Müller.
Australian Mosses; by F. Müller.
Fragmenta Phytographiæ Australiæ,
vols. ii. and iii.; by F. Müller.
The Vegetation of Chatham Islands;
by F. Müller.
Statistical Notes on the progress of
Australia; by W. H. Archer, 1st.
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- Huddersfield Archaeologi- } Papers read at Slack, 13th April,
cal and Topographical } 1866; by R. Walker, Esq., M. D.,
Association and Fairless Barber, Esq.
- India, Geological Survey of Palæontologia Indica, vol. iii., parts
6—9, and vol iv., part 1.
Memoirs of the Geological Survey of
India, vol. iv., part 3, and vol. v.,
part 1.
Catalogue of Fossil Echinodermata in
the Museum of the Survey.
Catalogue of Meteoric Stones and
Meteoric Irons in the Museum of
the Survey.
Annual Report for 1864.
- Pritchett, J. P., Esq. Set of Annual Reports of Yorkshire
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dress, and Catalogue of the Library.
- Read, W. H. R., Esq. } Proceedings of the Linnean Society
(York) } for 1866.
Journal of the Royal Horticultural
Society for 1866.
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- Smithsonian Institution, } Report for 1864.
(Washington)
- Society, Chemical..... Journal for 1866.
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- Society, Geological Quarterly Journal, Nos. 77—88.
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- Society, Manchester Literary and Philosophical .. } Memoirs, 3d. series, vol. ii.
Proceedings, vols. iii. and iv.
- Society, Royal, of Edinburgh..... } Transactions, vol. xxiv., part 1.
Proceedings for 1864—65.
- Society, Whitby Literary and Philosophical } Forty-third Annual Report.
- Society, Zoological (*London*) Transactions, vol v., part 5.
- Tyneside Naturalists' Field Club } Natural History transactions of North-
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No. 1.

BOOKS PURCHASED.

- Annuaire des Sociétés Savantes*, 1866; par le Comte Achmet d'Héricourt.
- Engelhardt's Denmark in the Iron Age.
- Redtenbacher's Fauna Austriaca, (Coleoptera).

SERIAL WORKS SUBSCRIBED FOR.

- Birds of Australia, by John Gould, F. R. S., supplementary parts (3 published).
- Birds of Asia, by the same (18 parts published).
- Exotic Butterflies, being Illustrations of New Species chiefly selected from the Collection of W. Wilson Saunders and W. C. Hewitson. By W. C. Hewitson. (23 nos.)
- Fauna Antiqua Sivalensis, or Geology of the Sewalik Hills, in the North of India, by Dr. Falconer and Major Cautley. (Parts 1 to 9 of Illustrations, and part 1 of Letterpress.)
- Proceedings of the Zoological Society, with Illustrations.
- Publications of the Palaeontographical Society.
- Publications of the Ray Society.
- Sowerby's Thesaurus Conchyliorum, col. plates (25 parts published).

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